

RAW SEQUENCE LISTING

**The Biotechnology Systems Branch of the Scientific and Technical
Information Center (STIC) no errors detected.**

Application Serial Number: 10/797,553E
Source: IF-60
Date Processed by STIC: 04/27/2006

ENTERED

CRF Errors Edited by the STIC Systems Branch

Serial Number: 10/797,553 E

CRF Edit Date: 04/27/2006
Edited by: DA

___ Realigned nucleic acid/amino acid numbers/text in cases where the sequence text "wrapped" to the next line

___ Corrected the SEQ ID NO. Sequence numbers edited were:

___ Inserted or corrected a nucleic number at the end of a nucleic line. SEQ ID NO's edited:

___ Deleted: ___ invalid beginning/end-of-file text ; ___ page numbers

___ Inserted mandatory headings/numeric identifiers, specifically:

___ Moved responses to same line as heading/numeric identifier, specifically:

___/ Other: Corrected Invalid Amino Acid
numbering on Seq ID-56.



IFWO

RAW SEQUENCE LISTING

DATE: 04/27/2006

PATENT APPLICATION: US/10/797,553E

TIME: 10:29:55

Input Set :- A:\PTO\CA.txt

Output Set: N:\CRF4\04272006\J797553E.raw

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3 <110> APPLICANT: Moyle, William R.
4      Xing, Yongna
6 <120> TITLE OF INVENTION: Protein Knobs
8 <130> FILE REFERENCE: 1092/US PCT
10 <140> CURRENT APPLICATION NUMBER: 10/797,553E
11 <141> CURRENT FILING DATE: 2004-03-10
13 <160> NUMBER OF SEQ ID NOS: 66
15 <170> SOFTWARE: PatentIn version 3.1
17 <210> SEQ ID NO: 1
18 <211> LENGTH: 92
19 <212> TYPE: PRT
20 <213> ORGANISM: Homo sapiens
22 <400> SEQUENCE: 1
24 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
25 1          5          10          15
27 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
28          20          25          30
30 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
31          35          40          45
33 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
34          50          55          60
36 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
37 65          70          75          80
39 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
40          85          90
43 <210> SEQ ID NO: 2
44 <211> LENGTH: 92
45 <212> TYPE: PRT
46 <213> ORGANISM: Artificial Sequence
48 <220> FEATURE:
49 <223> OTHER INFORMATION: human chorionic gonadotropin alpha-subunit with Cys
50      substituted for Gln5
52 <400> SEQUENCE: 2
54 Ala Pro Asp Val Cys Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
55 1          5          10          15
57 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
58          20          25          30
60 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
61          35          40          45
63 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
64          50          55          60
66 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
67 65          70          75          80

```

RAW SEQUENCE LISTING

DATE: 04/27/2006

PATENT APPLICATION: US/10/797,553E

TIME: 10:29:55

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\04272006\J797553E.raw

69 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser

70 85 90

72 <210> SEQ ID NO: 3

73 <211> LENGTH: 92

74 <212> TYPE: PRT

75 <213> ORGANISM: Artificial Sequence

77 <220> FEATURE:

78 <223> OTHER INFORMATION: human chorionic gonadotropin alpha-subunit with Cys

79 substituted for Leu12

81 <400> SEQUENCE: 3

83 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Cys Gln Glu Asn Pro

84 1 5 10 15

86 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys

87 20 25 30

89 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu

90 35 40 45

92 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser

93 50 55 60

95 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr

96 65 70 75 80

98 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser

99 85 90

102 <210> SEQ ID NO: 4

103 <211> LENGTH: 92

104 <212> TYPE: PRT

105 <213> ORGANISM: Artificial Sequence

107 <220> FEATURE:

108 <223> OTHER INFORMATION: human chorionic gonadotropin alpha-subunit with Cys

109 substituted for Asn15

111 <400> SEQUENCE: 4

113 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Cys Pro

114 1 5 10 15

116 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys

117 20 25 30

119 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu

120 35 40 45

122 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser

123 50 55 60

125 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr

126 65 70 75 80

128 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser

129 85 90

132 <210> SEQ ID NO: 5

133 <211> LENGTH: 92

134 <212> TYPE: PRT

135 <213> ORGANISM: Artificial Sequence

137 <220> FEATURE:

138 <223> OTHER INFORMATION: human chorionic gonadotropin alpha-subunit with Cys

139 substituted for Phe17

RAW SEQUENCE LISTING

DATE: 04/27/2006

PATENT APPLICATION: US/10/797,553E

TIME: 10:29:55

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\04272006\J797553E.raw

141 <400> SEQUENCE: 5

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143 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
144 1          5          10          15
146 Cys Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
147          20          25          30
149 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
150          35          40          45
152 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
153          50          55          60
155 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
156 65          70          75          80
158 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
159          85          90

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162 <210> SEQ ID NO: 6

163 <211> LENGTH: 92

164 <212> TYPE: PRT

165 <213> ORGANISM: Artificial Sequence

167 <220> FEATURE:

168 <223> OTHER INFORMATION: human chorionic gonadotropin alpha-subunit with Cys
 169 substituted for Leu22

171 <400> SEQUENCE: 6

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173 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
174 1          5          10          15
176 Phe Phe Ser Gln Pro Cys Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
177          20          25          30
179 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
180          35          40          45
182 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
183          50          55          60
185 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
186 65          70          75          80
188 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
189          85          90

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192 <210> SEQ ID NO: 7

193 <211> LENGTH: 92

194 <212> TYPE: PRT

195 <213> ORGANISM: Artificial Sequence

197 <220> FEATURE:

198 <223> OTHER INFORMATION: human chorionic gonadotropin alpha-subunit with Cys
 199 substituted for Gln7

201 <400> SEQUENCE: 7

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203 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
204 1          5          10          15
206 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Cys Cys Met Gly Cys Cys
207          20          25          30
209 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
210          35          40          45
212 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
213          50          55          60

```

RAW SEQUENCE LISTING

DATE: 04/27/2006

PATENT APPLICATION: US/10/797,553E

TIME: 10:29:55

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\04272006\J797553E.raw

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215 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
216 65                      70                      75                      80
218 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
219                      85                      90
222 <210> SEQ ID NO: 8
223 <211> LENGTH: 92
224 <212> TYPE: PRT
225 <213> ORGANISM: Artificial Sequence
227 <220> FEATURE:
228 <223> OTHER INFORMATION: human chorionic gonadotropin alpha-subunit with Cys
229      substituted for Leu22
231 <400> SEQUENCE: 8
233 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Cys Gln Glu Asn Pro
234 1                      5                      10                      15
236 Phe Phe Ser Gln Pro Cys Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
237                      20                      25                      30
239 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
240                      35                      40                      45
242 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
243 50                      55                      60
245 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
246 65                      70                      75                      80
248 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
249                      85                      90
252 <210> SEQ ID NO: 9
253 <211> LENGTH: 92
254 <212> TYPE: PRT
255 <213> ORGANISM: Artificial Sequence
257 <220> FEATURE:
258 <223> OTHER INFORMATION: human chorionic gonadotropin alpha-subunit with Cys
259      substituted for Arg35
261 <400> SEQUENCE: 9
263 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
264 1                      5                      10                      15
267 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
268                      20                      25                      30
271 Phe Ser Cys Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
272                      35                      40                      45
275 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
276 50                      55                      60
279 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
280 65                      70                      75                      80
283 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
284                      85                      90
287 <210> SEQ ID NO: 10
288 <211> LENGTH: 92
289 <212> TYPE: PRT
290 <213> ORGANISM: Artificial Sequence
292 <220> FEATURE:

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RAW SEQUENCE LISTING

DATE: 04/27/2006

PATENT APPLICATION: US/10/797,553E

TIME: 10:29:55

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\04272006\J797553E.raw

293 <223> OTHER INFORMATION: human chorionic gonadotropin alpha-subunit with Cys
 294 substituted for Tyr37

296 <400> SEQUENCE: 10

298 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro

299 1 5 10 15

302 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys

303 20 25 30

306 Phe Ser Arg Ala Cys Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu

307 35 40 45

310 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser

311 50 55 60

314 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr

315 65 70 75 80

318 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser

319 85 90

322 <210> SEQ ID NO: 11

323 <211> LENGTH: 92

324 <212> TYPE: PRT

325 <213> ORGANISM: Artificial Sequence.

327 <220> FEATURE:

328 <223> OTHER INFORMATION: human chorionic gonadotropin alpha-subunit with Cys
 329 substituted for Pro38

331 <400> SEQUENCE: 11

333 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro

334 1 5 10 15

337 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys

338 20 25 30

341 Phe Ser Arg Ala Tyr Cys Thr Pro Leu Arg Ser Lys Lys Thr Met Leu

342 35 40 45

345 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser

346 50 55 60

349 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr

350 65 70 75 80

353 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser

354 85 90

357 <210> SEQ ID NO: 12

358 <211> LENGTH: 92

359 <212> TYPE: PRT

360 <213> ORGANISM: Artificial Sequence

362 <220> FEATURE:

363 <223> OTHER INFORMATION: human chorionic gonadotropin alpha-subunit with Cys
 364 substituted for Thr39

366 <400> SEQUENCE: 12

368 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro

369 1 5 10 15

372 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys

373 20 25 30

376 Phe Ser Arg Ala Tyr Pro Cys Pro Leu Arg Ser Lys Lys Thr Met Leu

377 35 40 45

RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/10/797,553E

DATE: 04/27/2006
TIME: 10:29:56

Input Set : A:\PTO.DA.txt
Output Set: N:\CRF4\04272006\J797553E.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:56; Xaa Pos. 1,2,3,4,5,6,7,8,9,10,17,18,19,20,21,22,23,24,25,26,28,29

Seq#:56; Xaa Pos. 30,31,32,33,34,35,36,37

VERIFICATION SUMMARY

DATE: 04/27/2006

PATENT APPLICATION: US/10/797,553E

TIME: 10:29:56

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\04272006\J797553E.raw

L:1345 M:259 W: Allowed number of lines exceeded, <223> Other Information:
L:2179 M:258 W: Mandatory Feature missing, <221> Tag not found for SEQ ID#:56
L:2179 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:56 after pos.:0
L:2181 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:56 after pos.:16
L:2185 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:56 after pos.:32

Raw Sequence Listing before editing,
for reference only



IFWO

RAW SEQUENCE LISTING

DATE: 04/25/2006

PATENT APPLICATION: US/10/797,553E

TIME: 10:18:26

Input Set : A:\1092 US PCT SEQ LIST.4.19.06.txt

Output Set: N:\CRF4\04252006\J797553E.raw

3 <110> APPLICANT: Moyle, William R.
 4 Xing, Yongna
 6 <120> TITLE OF INVENTION: Protein Knobs
 8 <130> FILE REFERENCE: 1092/US PCT
 10 <140> CURRENT APPLICATION NUMBER: 10/797,553E
 11 <141> CURRENT FILING DATE: 2004-03-10
 13 <160> NUMBER OF SEQ ID NOS: 66
 15 <170> SOFTWARE: PatentIn version 3.1

Does Not Comply
 Corrected Diskette Needed
 (pg-1)

ERRORED SEQUENCES

2167 <210> SEQ ID NO: 56
 2168 <211> LENGTH: 37
 2169 <212> TYPE: PRT
 2170 <213> ORGANISM: Artificial Sequence
 2172 <220> FEATURE:
 2173 <222> LOCATION: Xaa may be amino acids 1-10, 17-26 and 28-37 of tail portion
 2174 <223> OTHER INFORMATION: Xaa is any amino acid in the tail portion and some of the

Xaa

2175 may be missing from the tail portion

2177 <400> SEQUENCE: 56

W--> 2179 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asp Asp Asp Asp Lys Ser

E--> 2180 1 (5) 5 (10) 10 (15) 15 (20) 20 (25) 25 (30) 30

2183 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Cys Xaa Xaa Xaa Xaa Xaa

2184 20 25 30

2187 Xaa Xaa Xaa Xaa Xaa

2188 35

Invalid
 Amino acid
 numbering.

VERIFICATION SUMMARY

DATE: 04/25/2006

PATENT APPLICATION: US/10/797,553E

TIME: 10:18:27

Input Set : A:\1092 US PCT SEQ LIST.4.19.06.txt

Output Set: N:\CRF4\04252006\J797553E.raw

L:1345 M:259 W: Allowed number of lines exceeded, <223> Other Information:
L:2179 M:258 W: Mandatory Feature missing, <221> Tag not found for SEQ ID#:56
L:2179 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:56 after pos.:0
L:2180 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:56
M:341 Repeated in SeqNo=56